Creation/Evolution

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About this issue . . .

In this issue, Tom McIver again brings his historical scholarship to bear on an issue relevant to creationism. This time, he explores the history of and the major players in the development and promotion of the "gap theory." Rarely do we treat in detail alternative creationist theories, preferring instead to focus upon the young-Earth special creationists who are so politically militant regarding public education. However, coverage of different creationist views is necessary from time to time in order to provide perspective and balance for those involved in the controversy.

The second article compares scripture to the doctrines of young-Earth special creationists and finds important disparities. Author Stanley Rice convincingly shows that "scientific" creationists add their own imaginative ideas in an effort to pseudoscientifically "flesh out" scripture.

But why do so many people accept creationist notions? Some have maintained that the answer may be found through the study of demographics. George E. Webb explores that possibility in "Demographic Change and Antievolution Sentiment" and comes to some interesting conclusions.

CREATION/EVOLUTION XXIV
(Volume 8, Number 3)
ISSN 0738-6001

Creation/Evolution, a publication dedicated to promoting evolutionary science, is published by the American Humanist Association. However, the views expressed herein do not necessarily reflect the views of the association, and the views of the AHA do not necessarily represent the views of the authors. *Creation/Evolution* is published with the following subscription rates: four issues, $12.00; foreign addresses, $15.00; foreign air mail, $20.00. Individual issues, including back issues, are $3.00 each. Ten or more copies of the same issue are $2.00 each. Checks or money orders should be made payable in U.S. funds on a U.S. bank. Please send subscription requests, letters, changes of address, requests for information on reprint rights, article proposals, and other inquiries to:

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Formless and Void: Gap Theory Creationism

Tom McIver

There are three major types of creationism espoused by fundamentalist anti-evolutionists, each with variants, plus a few less popular types. Of the three major types, "strict" young-Earth Flood geology creation is the best known—indeed, it is often assumed that all creationists are of this type. This type aims to employ the most literal and direct interpretation of Genesis, and the strictest fundamentalists tend to insist upon it: fiat *ex nihilo* ("out of nothing") creation in six, twenty-four-hour days about six thousand or so years ago. *Creationism* is often assumed to mean young-Earth *ex nihilo* creation because, in this time of resurgent fundamentalism, the most prominent and effective creationist efforts—those of the Institute for Creation Research, the Creation Research Society, the Creation-Science Research Center, the Bible-Science Association, and others—all insist upon young-Earth creationism.

It takes, however, an extremely stubborn faith to maintain belief in strict young-Earth creation in the face of the overwhelming—and still increasing—scientific evidence of the great age of Earth and the universe (not to mention the difficulty of interpreting all geology in terms of a single, recent flood). Because of the obvious difficulties of the extreme young-Earth Flood geology position, many creationists hold one of the two other main positions: "day-age" or "gap theory" creationism. These allow the faithful to maintain belief in supernatural creation and the falsity of evolution but also allow for indefinitely long ages—either during (in between) the six days of creation or before. Each also involves critical compromises with the plainest, most literal reading of the Bible in order to force scripture into concordance with scientific evidence regarding the age of Earth.

"Day-age" creationism takes a simple approach: the six "days" of creation were not literal twenty-four-hour days but, rather, long ages. There are various means of reconciling this interpretation with the biblical account which need not

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concern us here. The advantages of this interpretation are obvious: each creation "day" can be made as long as necessary, and the successive appearance of forms of life in the fossil record millions of years apart presents no problem—as long as these can all be interpreted as occurring in the same order as the sequence of events described in the six "days" of Genesis. (And this latter point does involve some stubborn difficulties. To mention only two: plants are created on the third day, although the sun is not created until the following "day"—millions of years later; and birds, as well as fish, are created on the fifth day, before land animals—in direct contradiction to the fossil record.)

The "gap theory," also known as the "ruin-restitution" theory, preserves the literal, recent six twenty-four-hour-day creation but assumes that the vast ages so well attested to by science occurred *prior* to this set of events. In other words, Earth—and life—was created *before* the creation week of Genesis. This exegesis is accomplished by postulating a tremendous "gap" between the very first two verses of Genesis, into which go all the geological ages:

> [Genesis 1:1] In the beginning God created the heaven and the earth.
>
> [Gap]
>
> [Genesis 1:2] And the earth was ["became"] without form, and void; . . .

The universe—heaven and Earth—was originally ("in the beginning") created aeons ago; life flourished for millions or billions of years. But this world (perhaps just Earth and not the entire universe) grew to be evil, and God destroyed it in a gigantic cataclysm. Earth became "without form and void" as a result of this destruction. (Gap theorists hold that the verb in the second verse is more accurately translated as *became* or *had become* rather than as *was*. The familiar six-day creation—a re-creation really—then followed, mere thousands of years ago, upon the ruin and chaos of this ancient former world.

Gap theory advocates, by this maneuver, are able to reconcile the scientific evidence for an old Earth and universe and for life itself. They, just as much as the young-Earth creationists, reject evolution; to them, the re-creation six thousand or so years ago was not entirely *ex nihilo* (although humans may have been created out of nothing) but was certainly by divine fiat. Therefore, although they differ markedly from "strict" creationists regarding the age of Earth, their anti-evolution attitudes and arguments are virtually identical.

Two Genesis Creation Accounts

The gap theory, incidentally, has nothing to do with the fact that there are two conflicting creation accounts in Genesis. Because gap theory creationism has received

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little attention compared to young-Earth creationism, and because its proponents tend to use the same anti-evolution arguments anyway, many critics of creationism are not aware of its existence or are conflused about what it claims. The two founders of the British anti-creationist group, Association for the Protection of Evolution (APE), for instance, erroneously reported in *Nature* that the gap theory "proposes that geology happened sometime between the Fall of Adam and the Flood" (Howgate and Lewis, 1984, p. 703). The editor of the *Secular Humanist Bulletin* mistook the gap theory for an attempt to reconcile the two creation accounts of Genesis, as did Michael Cavanaugh in his otherwise excellent sociological study of creationism (Franczyk, 1986; Cavanaugh, 1983, 169n.).

This may be a common misconception. According to gap theorists, both creation accounts—Genesis 1:1 through 2:3 and Genesis 2:4 through 3:24—concern the re-creation. I know of only two works which claim that the two Genesis creation accounts actually refer to two separate creations.

The first is A. J. Ferris's *The Conflict of Science and Religion*, in which the author writes that some races of humankind—Negroes, Mongols, and the like—were created first, in the first chapter of Genesis (to which he gives a day-age interpretation). Ferris's second chapter concerns the creation of Adam and the Adamic race. Adam's son Cain interbred with the pre-Adamic coloreds; their offspring are the Latin and Teuton races. (Later, Ham also interbred with the pre-Adamic line.) The purity of the Adamic race was maintained through Shem's line (Israel) and through Japheth (the Slavs). Ferris argues that the judgment of the Flood was upon Seth's line only—that it was a regional, not worldwide, flood, which the pre-Adamite races survived. The Association of the Covenant People, the British Columbia based publisher of Ferris's book, preaches Nordic-Celtic supremacy and British-Israelism (the doctrine that the British and Americans are the true descendants of the Lost Tribes of Israel) in its journal *Identity*.

The second work is E. K. V. Pearce's *Who Was Adam?* (1969; cited in Pun, 1982, p. 267). Pearce suggests that there were two Adams: the Adam of the first Genesis creation account lived in the Old Stone Age; the Adam of Genesis 2 in the New Stone Age. (Pun, by the way, opts for "progressive creationism" or variations of the day-age theory, with intermittent or overlapping "days.")

The standard way in which the two creation accounts of Genesis are reconciled, by both young-Earth and gap-theory creationists, is by considering the first account as narrated from God's perspective—the creation of the whole cosmos—while the second has a narrower focus on the creation of humankind, from the perspective of Adam. (This, of course, does not eliminate the obvious conflicts between the two, but that is another story. Suffice it to say that the first creation story was composed around the time of the Babylonian captivity and reflects much of the Mesopotamian myth and cosmogony to which the Hebrews were then exposed. The second creation story was composed several hundred years earlier in the time of the Solomonic Empire and reflects a somewhat nostalgic concern with

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the Hebrews' nomadic pastoralist traditions and myths. See, Hyers, 1984.)

The editor of the *Secular Humanist Bulletin* thus confused chapters (Genesis 1 and 2) with verses (Genesis 1:1 and 1:2). He also felt that belief in a gap, with destruction and re-creation by God, was so odd that few could actually believe in it. This may also be a common misconception. Odd it may be, but the gap theory was—and still is—widely believed. Though it is true that the age of Earth and the possibility or impossibility of a pre-Adamic era does not greatly concern most lay anti-evolutionists who merely insist on divine creation and denunciation of evolution, such matters are of enormous concern to the leaders and thinkers of the creationist movement. The young-Earth "strict" creationists devote much space and energy to refutations of the gap theory (and also the day-age theory) as an unbiblical, nonliteralist concession to evolutionary science—the first step on the road to compromise and surrender. Gap theorists and day-age believers, in turn, attack the young-Earth arguments with considerable ferocity.

Young-Earth, gap, and day-age proponents may all use the same anti-evolution arguments, and many of their followers may not care about the subtle differences in doctrine, but all see the rival creationist theories as very nearly as dangerous as evolution. Young-earthers think that the gap theory leads to heresy, apostasy, and eventual surrender to evolution; gap theorists think that to insist upon a recent *ex nihilo* creation is so unscientific that it threatens to make the whole idea of creation seem ridiculous and unworthy of consideration.

Origin of the Gap Theory

The gap theory became increasingly attractive during the end of the eighteenth century and first half of the nineteenth century, as the new scientific discipline of geology made it increasingly obvious that Earth was far older than a straightforward, literal interpretation of Genesis and the Bible-based Flood geology would allow. The gap theory provided an attractive escape from this dilemma, allowing religious geologists to preserve both their faith in the Bible and in the new authority of science, which, according to the doctrine of natural theology, was now considered a second revelation—God's word in nature as well as in scripture. The two revelations could not contradict each other; some means of reconciliation had to be found. (Another popular approach was simply to denounce science, and geology in particular, as being atheistic and impious. But most geologists of this era were good Christian believers who were convinced that God's truth was discoverable in nature.)

The agony of this dilemma is clearly seen in Philip Henry Gosse's *Omphalos: An Attempt to Untie the Geological Knot*, published just two years before Darwin's *Origin of Species*. A member of the fundamentalist Plymouth Brethren as well as a very competent naturalist, Gosse was torn between the obviously conflicting

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evidence of geology and the Bible. He cut this Gordian knot by his ingenious suggestion that Earth, including its geological strata and fossils, was created with the appearance of age, just as Adam was created as an adult, fully formed, with a belly button ("omphalos"). A functioning Earth would look mature—ancient even—the moment it was created. Gosse's triumphant and heartfelt suggestion met with ridicule from all sides. Fundamentalists condemned its conciliatory attitude toward scientific theories of the age of Earth. Creationists today, however, are often forced to concede "creation with appearance of age" for refractory evidence, although they are somewhat embarrassed by Gosse's bold application of this principle to its logical extreme.

The gap theory proved to be a much more popular reconciliation of Genesis with geology; in fact, it proved to be an almost irresistable temptation. In a scholarly appraisal of creationist theories, Bernard Ramm, an evangelical, wrote:

> The gap theory has become the standard interpretation throughout hyper-orthodoxy, appearing in an endless stream of books, booklets, Bible studies, and periodical articles. In fact, it has become so sacrosanct with some that to question it is equivalent to tampering with Sacred Scripture or to manifest modernistic leanings. [1954, p. 135]

The gap theory may not be the "standard" creationist interpretation today—Ramm was writing a few years prior to the reemergence of young-Earth Flood geology creationism in the 1960s—but it is still surprisingly popular.

Arthur C. Custance, a Canadian physiologist with a doctorate in anthropology and author of the well-known *Doorway Papers* series on creation and Christian evidences, wrote a privately published book, *Without Form and Void* (1970), arguing for the gap theory. This book is considered the strongest and most able defense of the gap theory available. Custance, who also has a master's degree in oriental languages, makes a valiant attempt to demonstra the validity of gap theory biblical exegesis by analysis of the Hebrew, Greek, and atin versions and study of other Bible passages claimed to support this interpretation. He also claims that belief in the gap theory antedated the aforementioned conflict engendered by the discovery of geological ages—that the ancient Bible commentators and church fathers endorsed it and that it is, in fact, the orthodox view rather than a desperate maneuver to avoid the inescapable dilemma posed by the rising science of geology.

Weston Fields responded just as vigorously to Custance a few years later in his book *Unformed and Unfilled: A Critique of the Gap Theory* (1976). Fields exhaustively refuted all of Custance's gap theory arguments and added the standard creation-science evidence for a young Earth. Fields denied Custance's claim of early support for the gap theory, arguing that some of the ancient commentators perhaps supposed there was an interval between Genesis 1:1 and 1:2 but that none of them ever posited a gap of vast ages with a "ruin-and-reconstruction" scenario. Among

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these early gap theory proponents claimed by Custance and refuted by Fields are the English poet Caedmon about 650, King Edgar of England in the tenth century, Episcopius of Holland in the seventeenth century, and commentaries in the *Zohar* (Book of Light), a collection of Jewish cabalistic and mystical traditions supposedly dating from the second century but which Fields notes is probably a medieval forgery. According to Fields, the first genuine statements of the gap theory were proposed in 1776 by J. C. Rosenmuller and in 1791 by J. A. Dathe.

Gap Theorists Before Darwin

It was definitely Thomas Chalmers, a divinity professor at the University of Edinburgh, who popularized the gap theory. He first lectured on it in 1814 and attributed it to Episcopius:

> My own opinion, as published in 1814, is that it [Genesis 1:1] forms no part of the first day—but refers to a period of indefinite antiquity when God created the worlds out of nothing. The commencement of the first day's work I hold to be the moving of God's Spirit upon the face of the waters. We can allow geology the amplest time . . . without infringing even on the literalities of the Mosaic record. . . . [Bixler, 1986, pp. 86–87]

Chalmers was greatly admired and extremely influential. He founded the Free Church of Scotland, was well respected for his work with the poor, and wrote one of the famous *Bridgewater Treatises* (a series by some of the best British scientists and clerics devoted to natural theology and proof of God's design in his creation), as well as other books on natural theology. The gap theory became a respectable means of reconciliation due in large part to Chalmers' prestigious advocacy. He may well be the actual inventor of the gap theory as well, at least in the form in which it is known today.

William Buckland, another Bridgewater author, fell back on the gap theory after retreating from his earlier, more extreme catastrophist position. The first geology professor at Oxford, Buckland had argued in *Religuiae Diluvianae* that the worldwide Flood had left much evidence in the upper geological strata; later, he acknowledged that Agassiz's new glacial theory fit the evidence better and gave up even his modified Flood geology. For geologists such as Buckland, the gap theory was often a means of retaining—or at least professing to retain—belief in the Bible as God's literal word while proceeding with the business of discovering Earth's actual history through scientific investigation.

John Bird Sumner, archbishop of Canterbury, also urged reconciliation of geology and scripture. In his *Treatise on the Records of Creation* (1816), he argued that Moses, speaking to a pre-scientific audience, simplified his account of creation

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and related only the last of a whole series of creations; the six-day creation was the rearrangement of the wreckage of previous worlds. Sumner was a "liberal." In the years before Darwin's theory of evolution, the more open-minded scientists and thinkers tended to opt for the gap theory rather than orthodox, literal young-Earth creationism; it was thus often part of a relatively liberal view of "reconciliation" between Genesis and geology.

Other prominent gap theory advocates in the first half of the nineteenth century included W. D. Conybeare, coauthor of *Outlines of the Geology of England and Wales* (1822); Sharon Turner, whose *Sacred History of the World* (1833) interpreted the gap theory to children and went through many editions; John Harris (*The Pre-Adamite Earth*, 1846; *Primeval Man*, 1849); Edward Hitchcock (*The Connection Between Geology and the Mosaic Account of Creation*, 1836; *The Historical and Geological Deluges Compared*, 1837; *The Religion of Geology*, 1854); and J. H. Kurtz, whom Ramm says "defends the gap theory in a most sane and reserved exposition" in *The Bible and Astronomy* (1853), although Kurtz also praised the "revelatory" theory of creationism (Millhauser, 1959, mentions several of these people).

Some gap theorists, such as W. Mullinger Higgins (*Mosaical and Mineral Geologies Compared*, 1833), denounced geologists as infidels attacking God. Anton Westermeyer, in *The Old Testament Vindicated from Modern Infidel Objections*, elaborated on gap theory theology. The German believed that generations of creatures of the original creation succumbed to Satan's corruption and became demons. During the six-day re-creation, God destroyed these demons or drove them from their original habitat; they, in turn, "tried to frustrate God's plan of creation and exert all that remained to them of might and power to hinder or at least to mar the new creation." The creatures of which we have fossil remains were the result: "the horrible and destructive monsters, these caricatures and distortions of creation" (White, 1955).

John Pye Smith, in *On the Relations Between the Holy Scriptures and Some Parts of Geological Science* (1852, popularly known as *Scripture and Geology*), followed the lead of liberal geologists who had abandoned the theory of a worldwide flood and tried to reconcile geology with the Bible by devising his own cosmogony. He proposed that the six-day creation, like the Flood, was regional rather than worldwide—God had flooded and laid waste to a certain area, then reorganized and restored it as Eden to be humankind's dwelling place some six thousand years ago. (The original creation had occurred ages before.) This strange scheme had few followers, but, according to Millhauser, it was praised by scientists such as William Whewell, Adam Sedgwick, Baden Powell, and Sir John Herschel.

Gap Theorists After Darwin

Before Darwin's theory of evolution, gap theory creationism was generally a rela-

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tively liberal doctrine because it injected the immense ages required by the new science of geology into the framework of Genesis. After Darwin, it continued to serve as a means of providing great ages for geology, but its flat denial of evolution now rendered it simply an old-Earth version of conservative religious opposition to evolution.

"If it was Chalmers who first vigorously advocated [the gap theory] in modern times," says Ramm, "it was the work of G. H. Pember which canonized it" (Ramm, 1954, p. 135). Pember's book, *Earth's Earliest Ages*, was originally published in 1876; there since have been editions by several publishers up to 1975. Pember cautions that God has not revealed to humans how to interpret geology; for this, we must rely upon geologists. The Bible does indicate that God did not create Earth in chaos; if it had been "without form and void," this could only have been the result of Satan's rebellion and the destruction of the former world by God before Genesis 1:3.

> It is thus clear that the second verse of Genesis describes the earth as a ruin; but there is no hint of the time which elapsed between creation and this ruin. Age after age may have rolled away, and it was probably during their course that the strata of the earth's crust were gradually developed. Hence we see that geological attacks upon the Scriptures are altogether wide of the mark, are a mere beating of the air. There is room for any length of time between the first and second verses of the Bible. And again; since we have no inspired account of the geological formations, we are at liberty to believe that they were developed just in the order in which we find them. The whole process took place in preadamite times, in connection, perhaps, with another race of beings, and, consequently, does not at present concern us. [1975, p. 32]

> We see, then, that God created the heavens and the earth perfect and beautiful in their beginning, and that at some subsequent period, how remote we cannot tell, the earth had passed into a state of utter desolation, and was void of all life. Not merely had its fruitful places become a wilderness, and all its cities been broken down; but the very light of its sun had been withdrawn; all the moisture of its atmosphere had sunk upon its surface; and the vast deep, to which God had set bounds that are never transgressed save when wrath has gone forth from Him, had burst those limits; so that the ruined planet, covered above its very mountain tops with the black flood of destruction, was rolling through space in a horror of great darkness. [1975, p. 34]

"But what could have occasioned so terrific a catastrophe?" continues Pember. Why would God have destroyed his own handiwork?

Fossils "clearly show" that disease, ferocity, death, and slaughter were rampant in this former world. This is proof it was a different creation, since the Bible declares that no evil or death entered into our world until Adam sinned. So it must have

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been a gigantic accumulation of sin in the former world which caused its hideous destruction. Pember then reconstructs, from imaginative interpretation of various apocalyptic Bible passages, the drama of Satan's rebellion and his sin-stained pre-Adamic rule. God created a perfect and beautiful world, fit for habitation and not chaos (Isaiah 45:18). He created Satan as the fairest and wisest of his creatures and placed him in "Eden" (Ezekiel 28:13)—an Eden similar to that in which Adam was later created but even more like the apocalyptic New Jerusalem. Pride corrupted Satan, and he rebelled.

Pember distinguishes between corrupted "angels" who joined Satan's rebellion, and "demons," the spirits of the sinful pre-Adamite creatures who walked Earth in ages past. If there was a pre-Adamite race of creatures or beings, where are their fossils? Pember offers several suggestions: God might have zapped or rotted them; they might have been swallowed up by the Earth; or, most likely, they may be entombed at the bottom of the abyss, where their spirits are still imprisoned.

In *Genesis in Harmony With Itself and Science* (1899), George Rapkin discussed the pre-Adamite races, identifying the antediluvian Nephilim ("giants") of Genesis 6:4 with surviving aboriginal pre-Adamites. Except for the gap, he followed the strict literal interpretation: the Flood and Ussher's chronology for the re-creation.

Early Twentieth-Century Gap Theorists

The gap theory got a tremendous boost when Cyrus Scofield endorsed it in the notes of his famous reference bible. Published in 1909 by Oxford, with an expanded edition in 1917, the *Scofield Reference Bible* had an enormous influence in defining and propagating the doctrines of the rising fundamentalist movement. Scofield legitimized as well the doctrine of "dispensationalism"—the view that God operated and interacted with humankind differently in clearly demarcated dispensations or historical periods, establishing different covenants. Scofield also stressed premillennialism—the view that Christ will return to rule on Earth at the beginning of the millennium. Thrashed out at various Bible conferences around the turn of the century, dispensationalist premillennialism, along with the doctrine of the rapture, became a key fundamentalist doctrine, due in large part to Scofield's popularization, and is still an important doctrine among very many fundamentalists today.

The *Scofield Reference Bible*, perhaps the most widely distributed annotated Bible in the English-speaking world, gave the gap theory great prestige. In his note to Genesis 1:1, Scofield states that the "first creative act refers to the dateless past and gives scope for all the geologic ages." Referring to the third day of the "new creation," when God commanded Earth to "bring forth" vegetation, Scofield asserts that seeds probably survived the catastrophic judgment of Genesis 1:2 and were allowed to grow again in the newly reconstituted earth:

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> It was *animal* life which perished, the traces of which remain as fossils. Relegate fossils to the primitive creation, and no conflict of science with the Genesis cosmogony remains.

Like Pember, Scofield cites Isaiah and Ezekiel and also Jeremiah 4:23–26 to support the idea of the ancient pre-Adamic creation.

In the *New Scofield Reference Bible*, a 1967 revised edition, and in the 1984 NIV Scofield Bible, the gap theory is somewhat downplayed; the supporting comments are relegated mostly to Isaiah rather than Genesis, where it is mentioned only as a possible interpretation. The older editions remain quite popular with fundamentalists.

Watchman Nee, a Chinese theologian, argued strongly for the gap theory in a series of "Meditations on Genesis," published from 1925 through 1927. These have been issued as *The Mystery of Creation* (1981), an English translation in book form. Nee follows Pember closely (he also cites Chalmers); his work is a very readable summary of Pember's classic interpretation. Nee openly professes his attitude toward claims of science which may conflict with his interpretation of the Bible:

> If both Genesis and geology are before us, what we follow must be Genesis and not geology because God is behind Genesis. If Genesis and geology differ, the error must be on the side of geology, for the authority of the Bible is beyond questioning. [1981, p. 2]

That taken care of, he proceeds to assure us that Genesis, when correctly interpreted—that is, the gap theory—does not conflict with geology in the slightest.

Nee states that 2 Peter 3:5–7 refers to the pre-Adamic world, its destruction by flood, and the present creation. Strict creationists insist that a straightforward reading of this passage clearly shows this to be Noah's Flood, not some pre-Adamic cataclysm. Indeed, John Whitcomb, coauthor with Henry Morris of *The Genesis Flood* (the book largely responsible for the revival of Flood geology and young-Earth creationism), entitled his sequel *The World That Perished*, quoting 2 Peter 3:6. (This chapter of 2 Peter is a rich source of "proofs" for various and conflicting schools of creationism. The verses just before those quoted by Nee refer to "scoffers" during the last days who do not believe God ever destroyed the world or could do so in the future; many creationists like to think it also alludes to uniformitarian evolutionists. The verse immediately following, which says that "one day is with the Lord as a thousand years," is the best available scriptural evidence for day-age creationism. And the coming of the Lord "as a thief in the night," two verses later, followed by the destruction of Earth, is cited by pretribulation premillennialists as support of the secret rapture of the faithful.)

The major gap theory advocate during the time of the *Scopes* trial and for some years afterward was Harry Rimmer, a flamboyant creationist proselytizer. Rimmer,

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a Presbyterian minister, and George McCready Price, a Seventh-day Adventist, were the most influential creation "scientists" of that period. (Price was a strict young-Earth creationist who reinvented Flood geology, setting the stage for its popular revival following Whitcomb and Morris's *Genesis Flood*.) Rimmer operated a one-man "research science bureau" during the 1920s, wrote several anti-evolution books, and promoted creationism with great effectiveness in lectures and public debates. He offered one thousand dollars for proof of any scientific error in the Bible and was brought to court in 1939 by a claimant; the presiding judge ruled in Rimmer's favor (Rimmer, 1956).

Besides debating evolutionists, which was child's play to Rimmer, he engaged in a friendly but profound public debate with day-age creationist William Bell Riley in 1929. Riley, a Baptist minister, founded the World's Christian Fundamentals Association, a leading fundamentalist organization, and was himself an indefatigable crusader against evolution.

Rimmer's *The Theory of Evolution and the Facts of Science* (1935), *The Harmony of Science and Scripture* (1936), and *Modern Science and the Genesis Record* (1937) were leading statements of Bible science during this period. Although he campaigned vigorously for the gap theory, Rimmer also paid deference to Price's Flood geology (1936, pp. 238–242), apparently not noticing any contradiction between explaining geology and paleontology in terms of Noah's Flood and as a pre-Adamic creation. Rimmer tried to maintain a liberal interpretation of Noah's Flood; he also interpreted the re-creation as six literal twenty-four-hour days and gave literal interpretations of Jonah and the whale and of Joshua's long day (citing Totten's 1890 "proof").

Arno Gaebelein, one of Scofield's consulting editors and the influential editor of the premillennialist journal *Our Hope*, argued for the gap theory in *The Conflict of the Ages* (1933). He devoted a chapter to Satan's pre-Adamic reign and traced the hideous modern evils of atheism, evolution, the Illuminati conspiracy, and Bolshevism back to this rebellion against God. (The 1983 edition, revised by D. Rausch, deleted several pages concerning the infamous "Protocols of the Elders of Zion," which Gaebelein thought might have originated with apostate communist Jews. Rausch notes that Gaebelein editorialized strongly against Hitler's persecution of the Jews and eventually repudiated the "Protocols." He expressed shock that anti-Semitic right-wing extremists endorsed Gaebelein's book.)

L. Allen Higley, a professor of chemistry and geology at Wheaton College, defended the gap theory, as well as a literal six-day re-creation afterward, in *Science and Truth* (1940). In 1935, the directors of the short-lived Religion and Science Association chose Higley, who had a Ph.D., as their first president. The founders intended the association to be a young-Earth Flood geology group and considered the gap theory to be "utter foolishness, both Biblically and scientifically"; apparently, they thought they could convince Higley to change his mind about it. But, as Morris ruefully notes, Higley remained committed, and his book was "surely one

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of the strongest expositions of the gap theory ever published" (Morris, 1984, p. 115). Morris, who strenuously opposes the gap theory and all old-Earth creationist models, points out that Wheaton awarded Rimmer an honorary doctorate and that its president was a day-age advocate.

But Morris himself—founder and president of the Institute for Creation Research, key figure in the popular re-emergence of creationism, leading theoretician of "creation science," and vigorous proponent of strict young-Earth Flood geology—once succumbed to the gap theory. His first book, *That You Might Believe*, published in 1946 when he was twenty-eight, advocated the gap theory in its first edition. In lectures to friendly audiences, Morris now demurely remarks that this edition is, blessedly, unavailable. (Morris's all-time bestseller, this book, in all its various editions and revisions, reemerged in 1951 as *The Bible and Modern Science* and in 1986 as *Science and the Bible*.)

Paul Johnson, in *Creation (Epiphany Studies in the Scriptures Vol. II)* (1938), specifically denied the standard gap theory in arguing against Bullinger's account of stellar origins but held that there was a long period prior to the six creation days. God set matter (gases) in motion in Genesis 1:1; this uninhabitable primeval chaos then gradually condensed and cooled. Johnson specifies that each creation "day" was seven thousand years long.

Johnson devoted considerable space to a fascinating presentation of the "canopy theory," which was first proposed by Isaac Newton Vail in 1874. In the long period before the six creation "days," Earth acquired seven annular layers—rings or canopies—discharged by the molten earth and suspended above its surface. Each of these canopy layers was composed of different substances and separated by gases and steam, with the heavier materials in the lower layers. At the end of each creation day-age, the lowermost layer collapsed. The collapse of the first six canopy layers produced the six geological strata which Johnson asserts were deposited worldwide. He saw "irrefutable and factual proof" in the six neat layers of the Grand Canyon, each several hundred feet thick (1938, pp. 319–323). The seventh and lightest canopy was composed of water, the cause of Noah's Flood when it collapsed. Many strict creationists today include a water canopy model (either liquid, vapor, or ice) in their creation science to account for Noah's Flood and the fabulous antediluvian conditions (extreme longevity, worldwide Edenic "greenhouse" climate), but these Flood geology versions are but single canopies which fell one time only.

The Laymen's Home Missionary Movement of Chester Springs, Pennsylvania, which distributes Johnson's book, repeats his unusual cosmogony in tracts such as "The Bible vs. Evolution" and "The Evolution Theory Examined"—although without attribution. The latter tract quotes a few fairly recent scientific authorities, and the casual reader cannot know that most of the scientific absurdities are taken from Johnson's 1938 book.

The canopy theory was further developed by Carl Theodore Schwarze, a professor of civil engineering at New York University and a member of the Plymouth

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Brethren, in *The Harmony of Science and the Bible* (1942) and *The Marvel of Earth's Canopies* (1957). Schwarze argued that the canopy was lofted up following an atomic explosion (Satan had been foolishly dabbling in atomic research in pre-Adamic times). This blast was the event described by Genesis 1:2; the future destruction in 2 Peter 3:10 will also be an atomic explosion (1957, pp. 12–13, 57). As a result of this pre-Adamic explosion, water was sent up first beyond the stratosphere, where it turned to ice and formed an oblate spherical canopy miles thick. Dirt and dust settled back to the surface to form the geological strata, but the ice-lens remained, causing the pre-Flood greenhouse effect and serving as the source of water for the Flood.

This ice canopy was shattered, causing its collapse, by the creation and ejection of the moon from the Pacific basin, which also caused the Mid-Atlantic rift and the destruction of Atlantis (1957, pp. 31–32). Fermentation was impossible under canopy conditions; Noah got drunk after the Flood because he was unaware that his grape juice had changed (Johnson also used this example). Schwarze, like strict creationist canopy advocates today, assured his readers that this marvelous canopy will be restored at the millennium.

Current Gap Theorists

Why We Believe in Creation Not in Evolution (1959; now in its eighth edition) by Fred John Meldau, editor of *Christian Victory* magazine, is a compendium of examples of design in nature, marvelous animal and plant adaptations, and scientific quotes. Near the end of the book, Meldau mentions that there have been "two or more overwhelming Deluges in the history of our earth." One such geologically cataclysmic event was Noah's Flood; another was the tremendous upheaval "implied" in Genesis 1:2 (1974, p. 309). Humankind was created six thousand to eight thousand years ago.

A great many people have been exposed to the gap theory through the efforts of Herbert W. Armstrong. Over eight million free copies of his magazine, *The Plain Truth*, have been distributed each month (circulation has dipped somewhat since his death in 1986); books and pamphlets are also given away free; and his show, "The World Tomorrow," is broadcast widely on radio and television. In 1926, at the age of thirty-four, Armstrong's successful advertising business collapsed, and he plunged into an intensive search for truth, provoked by his wife's assertion that Sunday was not the true day of worship and by doubts about evolution. Armstrong was convinced that he—and he alone—discovered the truth. He founded the Worldwide Church of God, began *Plain Truth* in 1934, and founded Ambassador College in 1947 in Pasadena, California (with branch campuses in Texas and England).

Armstrong was not a strict fundamentalist—indeed, fundamentalists consider him to have been a heretical cult leader. He denied key fundamentalist doctrines—

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such as the trinity, the reality of hell, the immortality of the soul, and Sunday worship—and espoused a version of British-Israelism (that Britons and Americans are the true descendants of the lost tribes of Israel, God's chosen people). In contrast to strict fundamentalists who stress the "perspicuity" of the Bible in addition to its inerrancy, Armstrong viewed the Bible as a great mystery or puzzle not intended to be decoded until now, when God revealed to him its secrets. Armstrong's book, *Mystery of the Ages*, published just before his death, was later serialized in *The Plain Truth*. In it, Armstrong reveals the Bible's hidden messages.

Not one to credit apostate predecessors, Armstrong declares that his gap theory interpretation is a "surprising truth . . . unrecognized by religion, by science and by higher education" (1985, p. 63). Stoutly anti-evolutionist since his initial Bible studies, Armstrong advocated the gap theory for decades; for instance, his 1959 booklet *Did God Create a Devil?* is still in print. He gives the standard gap theory arguments and refers to the same Bible passages as supporting Satan's pre-Adamic fall and reign—without, however, acknowledging other gap theorists. He allows for an Earth that is millions or billions (even "trillions") of years old with the re-creation "approximately 6,000 years ago."

Mystery of the Ages contains many sections describing the gap theory. Most issues of *The Plain Truth* contain at least references to it. Frequent *Plain Truth* anti-evolution articles profess to be against both evolution and "creationism"—that is, "fundamentalist groups . . . called scientific creationists" (see, for instance, "Evolutionists and Creationists Are At It Again!" Elliot, 1983). This declared opposition to both evolution and "creationism" results from Armstrong's gap theory position; "creationists" are called to task for believing in Flood geology and a young Earth. (It is also a reflection of Armstrong's claim to sole possession of the truth.) The anti-evolution arguments in these articles and in booklets with titles such as "A Theory for the Birds," "A Whale of a Tale," and "A Fishy Story About an Unproved Theory" (mostly written or coauthored by Armstrong's son, Garner Ted before their final schism) are exactly the same as those of the "creationists."

A. G. Tilney, a schoolmaster and pastor in England, wrote over a hundred pamphlets for the Evolution Protest Movement (now called the Creation Science Movement), one of the major British creationist organizations. A linguist by training, his EPM pamphlets covered a wide range of topics and included most of the standard anti-evolution arguments. Founded in 1932, EPM included many old-Earth creationists; however, young-Earthers now predominate. Tilney was a gap theory supporter, although his EPM pamphlets dealt only with attacks on evolution. In 1970, he published a book, *Without Form and Void*, presumably concerning the gap theory (Munday, 1986, p. 42).

L. Merson Davies was "the only geologist about whom I have ever heard or read," says Henry Morris, "who gave any credence to the gap theory" (1984, pp. 107–108). Davies was a paleontologist (specializing in foraminifera), a member of several scientific royal societies, a lieutenant-colonel, and an active member of the

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Evolution Protest Movement. In *The Bible and Modern Science* (1953), he argued both for the gap theory and for geological effects of the Flood. With another EPM member, Douglas Dewar, he engaged prominent geneticist J. B. S. Haldane in published debates on evolution.

M. R. DeHaan, a medical doctor, became very well known through his radio Bible class broadcasts. (His son, Richard, now does the broadcasts.) DeHaan's book, *Genesis and Evolution* (1962) is whole-heartedly creationist. It promotes the gap theory and insists on a literal six-day re-creation. DeHaan summarizes the standard gap theory arguments and announces that various geological strata provide clear evidence of "a great cataclysmic convolution of the earth in the dateless past." He adds one new twist by asserting that the water-covered chaos of Genesis 1:2 must have been frozen, causing the Ice Age, since the sun had not yet been created.

Fossils and the Word of God (1964) by Walter Galusha is one of the more amusing creationist books. Galusha proposes a modified gap theory, adding a creation. The first creation was followed by a catastrophe. The first people, fossil cavemen and cavewomen, inhabited the second creation; then, there was a second catastrophe. Adam and Eve were created in the third creation, six thousand years ago, and Noah's Flood destroyed that world in 2310 BCE. (Noah could talk to the animals, and they helped him build the ark.) Galusha advocates a crystal (ice) canopy. Since there were no carnivores in Eden, he suggests that boa constrictors may have swallowed watermelons. The antediluvians had electricity but not internal combustion engines. God divided humankind into four colors, says Galusha (1964, p. 108), and he "wants it to remain this way. But the devil," warns Galusha, "will try to get them to unite and in this way defeat God's purpose."

Charles C. Ryrie is a professor at Dallas Theological Seminary and obtained his doctorate from the University of Edinburgh. He rejects Ussher's chronology but insists that humankind is a recent creation. In his book *You Mean the Bible Teaches That?* (1974), he admits that Genesis 1:1–2 "may cover an interminably long period of time"—that is, the gap theory. However, he also permits a day-age interpretation and for good measure throws in the effects of the worldwide Flood and creation with appearance of age (pp. 121–122). Ryrie also wrote the tract "We Believe in Creation" (1967), stating the official position of the Dallas Theological Seminary faculty—again, allowing for either gap theory or day-age creationism.

A pamphlet by the International Christian Crusade of Toronto, entitled *A Biblical Cosmology* (1976), argues against both evolution and the young-Earth creationist interpretation, presenting in its stead the gap theory. Ussher's chronology is defended as valid for events since the re-creation. The pamphlet cautions that, although there have been six thousand-year periods so far, the seventh—the coming millennium—may not begin exactly in the year 2000. John R. Howitt, a Canadian psychiatrist and hospital superintendent, was the unlisted author of this and earlier ICC pamphlets, including the enormously influential booklet, *Evolution: "Science Falsely So-called,"* which converted Duane Gish to creationism. The gap

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theory is not mentioned in these other ICC publications.

The Jehovah's Witnesses are a proselytizing millennialist sect numbering about half a million. They are officially anti-evolutionist. Their 1967 book *Did Man Get Here By Evolution or By Creation?* has been published in thirteen languages, and at least eighteen million copies have been distributed. Written in a plain, earnest style, this book is packed with anti-evolution quotes (many out of context) from popular and scientific sources and is attractively illustrated. The Witnesses assert that humans were created about six thousand years ago but allow for a day-age interpretation of the six days of creation. They also specifically allow for a gap theory interpretation as well, stating that billions of years may have elapsed before the six creation days (1967, p. 97). They also believe that a worldwide Flood and the water canopy had significant effects on geology and dating.

The Jehovah's Witnesses came out with a new book in 1985, *Life—How Did It Get Here? By Evolution or By Creation?* (an updated version of their 1967 classic). This book is richly illustrated with photographs and color pictures and includes many of the more recent anti-evolution quotes (for example, Hitching and Bethell). As before, both the day-age view and the gap theory are endorsed (1985, p. 26).

Reuben Katter, after a career in business and religious college administration, wrote a couple of books "reconciling the theological and scientific viewpoints of the creation of the universe" which were published by Theotes-Logos Research, apparently Katter's one-man group. In *The History of Creation and Origin of the Species: A Scientific Theological Viewpoint* (1967; revised and updated in 1984) and in *Creationism: The Scientific Evidence of Creator Plan and Purpose for Mankind in His Universe* (1979), Katter reveals God's colossal plan for the future and explains how the entire history of the world and of life was part of this divine conception. These intricate and bizarre Bible science treatises are derived from fundamentalist creation science but are clearly stamped with Katter's idiosyncratic hermit-scientist approach.

According to Katter, Earth was created about twenty or so billion years ago. Katter accepts the standard geological timetable but interprets these ages as God's carefully prepared stages. Katter's chronology is summarized in *The History of Creation and Origin of the Species* (1984, pp. 118–119). Earth was then under Lucifer's management; he turned to evil, however, and became Satan. Beginning about 20,000 BCE, Earth was subjected to a period of four ice ages, ending about 8,000 BCE with the worldwide catastrophe which God precipitated by shifting Earth's axis. (2 Peter 3:6 refers to this catastrophe but not to Noah's Flood.) God re-created the world six to eight thousand years ago as described in Genesis. Katter accepts the traditional date of October 23, 4004 BCE, for Adam's creation. Noah's Flood occurred on Halloween in 2348 BCE. Katter includes detailed information about the dispensational scheme of history exhibited and prophesied in the Great Pyramid and other evidence from prophecy and Bible numerology. The pyramid predicts "3000 AD as the time of the Great White Throne Judgment"

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(1984, p. 36). Katter rounds off his treatise by explaining the twelve vast energy systems and dimensional levels of the cosmos, proposing a new atomic force along the way.

Another gap theory defense is the introductory essay by S. G. Posey in John O. Scott's strange book, *The Four Most Glorious Events in Human History: Or The Refutation of Evolution*. Posey, who deplores the "parading" of atheistic evolution on television, asserts that the false evolutionary assumptions resulted from the mistranslation of Genesis 1:2 (the word *was* should be *became*) in the King James Bible. Posey, a Southern Baptist, proclaims the standard gap theory sequence. Price (1982) cites R. B. Thieme's *Creation, Chaos, and Restoration* (1973) as also presenting the standard gap theory view.

J. Vernon McGee, a radio evangelist since 1941, has presented the gap theory in his "Thru the Bible Radio" program, which is broadcast in all fifty states and across six continents. The messages collected in *Genesis—Volume I* (1975) contain his gap theory defense, which follows the standard scenario of Satan's pre-Adamic reign. This book, which preserves the chatty style of his broadcasts, ridicules science and repeats many anti-evolution quotes and arguments. McGee, who recommends the *Scofield Reference Bible*, also praises the creation scientists of the Institute for Creation Research and endorses the Paluxy Cretaceous mantracks, the worldwide Flood, and a literal six-day re-creation. He mentions the pre-Flood canopy but feels that there was still no excuse for Noah's drunkenness.

The popular PTL television network founded by Jim Bakker apparently endorses the gap theory. It is taught in two volumes of Corvin's *Home Bible Study Course* (1976) published by PTL (Bixler, 1986, 87n).

Duane Thurman adopts a calm and very reasonable-sounding tone in *How to Think About Evolution and Other Bible-Science Controversies* (1978), stressing the need for critical evaluation of arguments and fallacies and discussing at length scientific method and proper interpretation of evidence. He chides both creationist and evolutionist extremists for relying upon unfair arguments and faulty logic. Thurman, an Oral Roberts University biology professor with a Berkeley doctorate in botany, barely betrays his discreet preference for the gap theory in presenting the various creationist theories.

Inspired by Armstrong and acknowledging the assistance of his Ambassador College faculty, William F. Dankenbring has written several books espousing gap theory creationism. *The First Genesis: The Saga of Creation vs. Evolution* (1975) covers the standard creation-science arguments, including tales of Noah's ark. The 1979 edition includes a foreword by NASA's Wernher von Braun. "Evolutionists often lump all Creationists in the same bag," complains Dankenbring, "not realizing there are broad and vast differences of thought among Creationists about Creation itself" (1979, p. 3). Namely, there are young-Earth creationists and gap theory (and other) creationists. Dankenbring suggests that the Neanderthals were surviving remnants of the pre-Adamic biblical Nephilim.

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Dankenbring's *The Creation Book for Children* (1976) also includes a foreword by Von Braun and presents the gap theory to youngsters. *Beyond Star Wars* (1978) carries this blurb, referring to Satan's pre-Adamic rebellion:

> Star Wars really happened! Long ago great battles raged in the universe. A great war caused vast destruction throughout the cosmos and upon the earth. Super beings battled for control of the universe, space, and time.

Subjects covered include Joshua's long day (caused by a comet disturbing the Earth's rotation), the lost continent of Atlantis (Dankenbring relies here upon Velikovsky), maps of the ancient sea kings, the Great Pyramid (Pharaoh Cheops was Job; the Great Pyramid was a memorial to the Flood), the Tower of Babel, frozen mammoths, and surviving Neanderthals.

Joel and Jane French continue this theme with *War Beyond the Stars: Angelic Encounters* (1979). Joel French, a staff engineer with a NASA contractor, is with the NASA chapter of the Full Gospel Business Men Fellowship International in Houston, Texas, and has "shared testimony" with astronaut T. Stafford. Their book concerns the heavenly war following the rebellion of Lucifer and one-third of the angels. Humans were created later where the dethroned Satan had once ruled. In other words, gap theory. The Frenches are particularly concerned with UFOs, which are supernatural space vehicles, either godly or satanic. Ezekiel's "chariots of fire" were flying saucers. UFOs have figured in recent conflicts; they skirmished on both sides of the Israeli Six-Day War. Hitler was a satanically inspired genius—but there was also godly intervention in World War II, such as at Dunkirk. A mysterious stranger—really the Archangel Michael—appeared at Nazi general staff meetings and persuaded the fiendishly clever German high command to adopt bad strategy decisions, providentially affecting the outcome of the war.

Benny Hinn, the Israeli-born, Canadian-bred televangelist of Orlando Christian Center in Orlando, Florida, also exploits the star wars motif in *War in the Heavenlies* (1984). This book gives a thoroughly standard gap theory presentation, though Hinn is far more concerned with Satan and his demons than with geology or biology. Hinn received the Holy Spirit while attending meetings of faith-healer Kathryn Kuhlman and was miraculously cured of stuttering when he accepted the calling of the Lord to preach. Hinn, like most gap theorists, believes that demons are the disembodied former inhabitants of the pre-Adamic world; it is because of this condition that they desperately seek to possess our human bodies. Satan's fallen angels are not demons. Satan was cast out of the third heaven; he and his fallen angels still inhabit the second heaven (though "he visits here a lot"). Most demons are imprisoned in the abyss, one of the five underworlds; relatively few demons are loose on Earth. The hell of Tartarus, another of the underworlds, holds those fallen angels who have "left their own habitation." Hinn explains that these are the "sons of God" who, leaving the second heaven, cohabited with women (the

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"daughters of men") in Genesis 6; their offspring were the wicked giants ("nephilim") of the days before the Flood.

Kenneth Hagin, a well-known author, televangelist, and head of RHEMA Bible Church (also known as Kenneth Hagin Ministries), includes the gap theory in his 1983 booklet, *The Origin and Operation of Demons* (volume one of his four-volume Satan, Demons, and Demon Possession series). Hagin is concerned with the same themes as Hinn: the "wicked spirits in the heavenlies"; their abodes in the various heavens; their natures, history, and classification. Like Hinn, Hagin was miraculously cured; he was "almost totally paralyzed and completely bedfast from a deformed heart and incurable blood disease" when he answered the Lord's call. Hagin has the useful ability to "discern what kinds of spirits are in a locality"; there are ever so many, and most are evil. He believes that the only logical explanation for all these spirits is the pre-Adamic creation of the gap theory. They were members of Satan's pre-Adamic kingdom on Earth.

Don Wardell, in *God Created* (1984), argues against young-Earth creationism and Flood geology. His gap theory presentation contains many of the usual arguments in simplified form; he suggests, however, that some plants and animals—seeds and "living fossils"—survived the darkness and flood of Genesis 1:2 into the six-day restoration and re-creation (1984, pp. 17, 56–57).

Ronald Wlodyga is another follower of Armstrong. He thanks Dankenbring, his publisher, as well, for helping him with his book *The Ultimate Source of All Super Natural Phenomena* (1981). The theme is that believers in the supernatural, the occult, astrology, and parapsychology foolishly think that these phenomena come from God. Wlodyga holds that they actually emanate from a dangerous and false messiah. Evolution, an "impossible fairy tale," cannot accept the reality of the spirit world. The forces behind the occult are very real, however, and are trying to deceive us. Wlodyga, like Armstrong, traces the descent of the true church—those few persecuted believers who kept alive the flame of correct worship—back to the Waldenses, Cathars, Puritans, and like groups. The Shroud of Turin is a satanic deception, as are false practices such as celebration of Christmas (Santa= Satan). Wlodyga discusses Hitler's demon-possession at some length. Satan's pre-Adamic rebellion—the gap theory—merits a whole section.

It's Science Fiction—It's a Fraud (1984) by Reginald Daly is a contentious book advocating the gap theory and disputing the young-Earth creationism of Morris, the Creation Research Society, and their ilk. The destruction of the "world that then was" by flood in 2 Peter refers to the pre-Adamic catastrophe, not to Noah's Flood. The cover sets the book's tone:

> Evolution is a quasi-religion camouflaged as "science." It's unconstitutional to use our taxes to brainwash students with irreligious, one-side-only. [*sic*]

The recently defrocked televangelist Jimmy Swaggart of Baton Rouge, Louisi-

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ana, regularly denounces evolution, presenting in its place the gap theory. Swaggart is a fire-breathing, spirit-filled, old-time Pentecostal preacher who plays his vast audiences as skillfully and effectively as he plays his gospel piano. (He learned to play on the same keyboard as his first cousin, pioneer rock 'n roller Jerry Lee Lewis, and claims to have sold more gospel albums than any other artist.) Swaggart has been seen by far more people than, say, Jerry Falwell; his weekly crusade broadcast, once seen by over sixteen million viewers every month (according to a Nielson survey taken prior to his sex scandal), was second only to Pat Robertson's "700 Club" among religious shows. Sneeringly contemptuous of academicians, scientists, and intellectuals, Swaggart nevertheless betrays a bitterness and envy regarding the powerful authority of science in modern society, grasping naively at any pseudoscientific Bible science rumor or tall tale that promises to undermine the validity of evolution or to prove the inerrancy of the Bible (McIver, 1986).

Besides frequent exposure in his televised crusade sermons, Swaggart presents the gap theory in an audio cassette set, *The Pre-Adamic Creation and Evolution.* The entire first half of this three-tape set is devoted to a presentation and defense of the gap theory. In addition to dwelling lovingly on Satan's sinful pre-Adamic reign, Swaggart emphasizes the necessity of allowing vast ages since the original creation. Geologists are "probably correct" in their claims, and, as he admits, "the evolutionist would beat your head in if you try to think that this earth is only six thousand years old." The second half of the set consists of scathing ridicule of evolution (although it lacks the spell-binding exhortative oratory of his live audience crusades), including many quips and quotes from no less an authority than William Jennings Bryan.

New Variations

Though not a gap theory supporter, R. Russell Bixler deserves mention here. His version of creationism likewise stems from a realization of the problem of the first three verses of Genesis. Bixler heads Christian television station WCPB in Pittsburgh, Pennsylvania, and was an organizer and sponsor of the 1986 International Conference on Creationism in Pittsburgh, the theme of which was "The Age of the Earth." His book *Earth, Fire, and Sea: The Untold Drama of Creation* (1986) came off the press just in time for that conference, which was clearly dominated by young-Earth creationists. From careful study of the Hebrew texts of the Old Testament, Jewish traditional sources, and ancient commentaries, Bixler concludes that the doctrine of *ex nihilo* creation—the very battle-cry of most creationists—is a spurious, nonliteral interpretation and, in fact, a gnostic "heresy."

Bixler favors a translation making Genesis 1:1 a dependent clause: "In the beginning of God's creating the heavens and the earth—the earth being a formless waste . . ." (1986, p. 28). The Bible says God did not create the Earth a chaos

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(Isaiah 45:18). Gap theorists insert billions of years between these verses; Bixler, however, solves the problem differently—in a way that may be closer to the actual intent of the ancient Hebrews. He declares that chaos existed *before* the first verse of Genesis. God may have created it originally, but the Bible does not speak of this. Genesis begins with chaos already in existence. Referring to Job, Psalms, and other scriptures, Bixler argues that chaos was under the control of evil and destructive entities. God's work during the six days of creation involved immense effort—actual "warfare" against this evil, which resisted mightily. The waters of the deep (the abyss) and the darkness are forcibly restrained. During the Flood, God allowed the waters of the deep and the waters above the firmament to revert temporarily to their former untamed state. Bixler equates the waters above the firmament with the water (vapor) canopy.

The titanic struggle between God and the evil chaos during creation week is unabashed dualism, as Bixler openly admits: "Certainly the Bible is dualistic!" (1986, p. 133). Bixler is fully aware that his exegesis makes Genesis more like pagan cosmogonies than the later Christian *ex nihilo* interpretations. He professes not to worry; Satan often counterfeits God's truth. Bixler also denies the doctrine of dispensationalism, asserting that God operates now just as he has since creation. He creates wine out of water and heals blind eyes—just as he created Earth from chaos.

Inspired by Velikovsky and especially by Donald Patten, who wrote a foreword to *Earth, Fire, and Sea*, Bixler proposes that creation was a cosmic catastrophe: the approach of an ice planet or comet to the fiery proto-Earth chaos. The first four days of creation involved extraterrestrial catastrophes. Appealing again to pagan cosmologies, Bixler suggests that the lesser light appointed to rule the night was Saturn (1986, p. 175). A later cosmic cataclysm provoked the Flood and the Ice Age and restructured the solar system, producing our moon.

Bixler dismisses the gap theory as an ad hoc "concordistic" attempt to harmonize the *ex nihilo* interpretation with accumulating evidence for an old Earth. He praises Fields' exegesis as "almost flawless" (except for his refusal to critically examine *creatio ex nihilo*) and cites many of the early commentators claimed to be proto-gap theorists by Custance and others, giving a more plausible rendering of their ideas as referring to pre-existent chaos. Bixler submits that his exegesis eliminates the vexing conflict between young-Earth and old-Earth dating claims, confessing that there is strong evidence for both. His model then proclaims the six-day creation of Genesis occurred just a few thousand years ago but the pre-existent Earth—in chaos—is billions of years old.

The authoritative *Unger's Bible Handbook*, respected by fundamentalists, similarly proposes a "pre-Genesis gap" while rejecting the standard gap theory. Merrill Unger, who calls his proposal a "re-creation revelation" theory, also includes it in his *Bible Dictionary:*

> Gen. 1:1–2 does not describe primeval creation *ex nihilo* but a much later

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> refashioning of judgment-ridden earth in preparation for a new order of creation—man. The six days that follow are *recreation* [*sic*], revealed to man in six literal days. [1957, p. 226]

Old-Earth creationist John Clayton advocates another variant—what his young-Earth critics call a modified gap theory. Clayton, an Indiana high school teacher with geological training, presents a popular creation science lecture series which is also available in film and video. In *The Source: Eternal Design or Infinite Accident?* (1976), a book aimed at students, Clayton attacks recent creation as well as evolution. He argues that the Genesis order of creation is the same as the geological record (reinterpreting some of the Bible terms) but also maintains that there were long ages before the six days of creation. However, he denies the standard gap theory, pointing out that there is no evidence for the global destruction it posits (1976, pp. 136–137). He proposes that the first few verses of Genesis precede by long ages the six-day creation and that, during the six-day creation, God created humankind *ex nihilo* but also made use of materials and life forms created in earlier ages which had developed through these ages into an ecosystem able to support humans and the other new forms. Clayton's hybrid scheme thus allows for some day-age interpretation and also, perhaps, some theistic evolution in addition to its modified gap theory.

Conclusion

The most thorough refutations of the gap theory come from rival creationists. They point out the absurdity of supposing that billions of years exist between the crack, as it were, of the first two verses of Genesis, which is a straightforward account of creation. They see no support anywhere in the Bible for such a notion. The alleged scriptural evidences for the gap theory do not concern these immense missing ages. Rather, they refer to Satan's rebellion and fall; as to when this occurred, the Bible is not at all clear. The apocalyptic passages used as evidence are about events of the then contemporary age or allusions to the future coming of the antichrist—or, in mythic fashion, to both simultaneously.

The gap theory was first proposed as an attempt to harmonize a "literal" reading of the Bible with the new evidence from geology regarding the great age of Earth. Claims that there were gap theory proponents prior to the rise of modern geology probably distort the intent of these early writers and commentators, though they may have believed in a preexistent chaos or a period of preparation before the six-day creation. Originally a concordistic theory accepting the new truths of geology and paleontology while preserving the eternal truth of the Bible, the gap theory later became subject to elaborate theological speculation. Satan was given reign over this immense pre-Adamic period by gap theorists, and they further populated

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this pre-Adamic world with his fallen angels and demons. Despite the intense and much-publicized efforts of young-Earth creationists, the gap theory remains quite popular today and is widely preached.

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Scientific Creationism: Adding Imagination to Scripture

Stanley Rice

Scientific creationism has been interpreted by most observers as a resurgence of belief in biblical literalism. I have surveyed the material of sixteen years of the creationist journal *Creation Research Society Quarterly* and have discovered that many creationist beliefs, while based upon biblical literalism, consist largely of extrabiblical and occasionally wild imagination. Therefore, a discussion of the appropriateness or the inappropriateness of biblical literalism can only be a partial treatment of the controversy.

Most theologians have not only rejected the literalist approach to the Bible but insist that such an interpretation was never intended by the Bible writers. Bernard Ramm called the version of literalism that is specific enough to give rise to scientific creationism "hyper-orthodox" (1954). Bruce Vawter made a distinction between the "literalistic" interpretation used by scientific creationists, in which each word has an exact meaning independent of the context, and a "literal" interpretation, which conveys the author's intended meaning (1983). Langdon Gilkey says that the kind of literalism used by scientific creationists is not a "carry over from the old" traditional Christianity but is a *product* of our technological society's very literalistic way of thinking (1983). Bernard Anderson insists that the meaning of Genesis accounts cannot be made to stand as an independent basis of science and separated from the historical context of Israel's liberation from Egypt (1983). There are many other Christian books and articles critical of the young-Earth creationist position (Beck, 1982; Bube, 1972; Fischer, 1981; Kenkel, 1985; Peacocke, 1979; Olson, 1982; Hyers, 1984; Young, 1982).

All of these publications have made the incorrect assumption that scientific creationism emerges directly and only from biblical literalism. The extrabiblical additions, which I will describe later on, include belief in not just *one* but two or more additional creations and in not just *one* worldwide catastrophe but in two

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or more. Writers such as Hyers (1984), Newell (1982), and Ruse (1982), who base their criticism of creationists on just a few of the popular creationist books, would not encounter these beliefs, to which the creationists do not generally like to alert the public.

The young-Earth creationists, therefore, do not subscribe to the motto of those true, humble literalists who say, "Speak where the Bible speaks, and keep silence where it keeps silence." Instead, they want to help the Bible out. This seems to occur for two reasons. Some extrabiblical beliefs are necessary in order to rescue biblical literalism and bring it into line with modern scientific knowledge. Because these beliefs are necessary corollaries of biblical literalism, they have achieved a doctrinal status among the scientific creationists and are given nearly equal credence with scripture itself. In other cases, the extrabiblical emendations are wholly unnecessary flights of fancy, upon which many creationists place as much emphasis as upon scripture itself. I do not impute personal blame upon all young-Earth creationists for these excesses, of course, and many of them are no doubt embarrassed by them. I only wish to illustrate the tendency of creationist writers to mix imagination with scripture and then to defend both.

As a Christian, I am distressed that these creationists present their own speculations as if they were biblical truth. It is my hope that the critics of creationism will concentrate their criticism on those individual creationists who have proved themselves scientifically and scripturally irresponsible rather than on the Bible and the Christian church in general. And it is my further hope that these creationists will begin to be more careful in their handling of scripture.

Events Suffounding the Fall

Some young-Earth creationists have attempted to translate the Fall of Man into scientific terms. The Bible teaches that "As in Adam all die . . ." (1 Corinthians 15:21–22). This passage and others have led to the doctrine of original sin, which has inspired lengthy disputations among theologians for centuries. One central difficulty the theologians have had to face is that they believe that Jesus was without sin yet was born a human just as we have been. Did Jesus inherit original sin? And, if so, how could he have been sinless?

In his 1980 book, *The Seed of the Woman*, Arthur Custance suggested that there was a poison substance—perhaps alcohol—in the forbidden fruit of Eden. Adam and Eve partook of it, but in some manner or other this poison got itself incorporated into Adam's sperm but not into Eve's eggs. The poison—which causes original sin—is passed on only through the sperm in each generation. Needless to say, such a scenario is completely impossible. A poison cannot get passed from one generation to the next, since only genes are passed on. Moreover, the genes get rescrambled each generation during the cell divisions that produce eggs and

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sperm. There is no way in which an entity would be passed on only in the sperm and never in the eggs unless it is in the Y-chromosome. But an appeal to the Y-chromosome does not help in this case because, on the average, half of the sperm have no Y-chromosome. Would Custance suggest that half of all children—specifically, all girls—are born free of original sin? And, of course, the little bit of alcohol Adam might have assimilated would have gotten overwhelmed by the massive amounts of drinking that his descendants did. Custance's elaborate scheme seems to have been motivated by one thing: he wanted to believe that original sin has a chemical basis.

Many scientific creationists have interpreted the word *death* to refer not only to human spiritual death but also to human physical death. In doing so, they fly directly into the face of the scripture that says "*In the day* that thou eatest thereof. . . ." Adam lived nine hundred years or so after the Fall, but God told him he would die the very day he ate of the tree. Obviously, God was referring to spiritual death. "*I die daily*," said Paul (1 Corinthians 15:31). "For you have died," he says in Colossians 3:3. These passages use the same word, *apothnesko*, as in 1 Corinthians 15:22. "We have passed from death into life" (1 John 3:14) uses the same word, *thanatos*, as in 1 Corinthians 15:21. Thus, the Bible uses *death* in more than one way. But many scientific creationists insist that whenever the word is used it must imply all of its meanings and therefore can never refer only to spiritual death. Riss insists that, if our resurrection is to be physical, like Christ's, then the death from which we are saved must likewise by physical (1983). (He obviously does not believe that Christians live forever physically after being saved, but he does not explain adequately how he escapes the necessity of this conclusion.) The Bible, however, unabashedly uses the word in more than one way—whether or not the creationists like it.

No death of animals. But many creationists do not stop there. They insist that there was no death of animals before the Fall, because Romans 8:19–22 mentions that the whole of creation is under bondage to sin and because the "very good" world that Genesis says God created could not have contained death of animals. To conclude from this that animals did not die before Adam's fall is at least uncertain. Lambert goes so far as to claim that there was no death of animals before the Flood (1983). Thus, the scientific creationists are obliged to explain, first, how carnivores were supposed to survive without eating meat and, second, how the populations of organisms were supposed to be controlled before the Fall.

Since most creationists have not attempted to address these implications of their doctrine, they refer to them, if at all, in vague generalities. A few creationists, however, have attempted to be more specific. Colin Brown claims that carnivores can get along just fine on a vegetarian diet (1983). He cites one example: Elsa the lioness in *Born Free*. From this one example, Brown concludes that all the lions, tigers, wolves, falcons, eagles, vultures, and so forth, in the world could get along

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on plant food if they had to. Never mind the fact that we do not see them doing so in nature even when they are starving. But suppose that all mammalian carnivores could convert to vegetarianism. There are many other carnivores that these creationists have forgotten about. What did spiders, with their sucking mouthparts, eat before the Fall? And there are countless species of parasitic wasps and mites that are unable to eat anything other than specific host animals. Can you imagine a mosquito, with no teeth, trying to suck blood out of a beet? Did ticks and fleas find satisfaction in biting dogbane and catnip rather than dogs and cats?

Brown dealt with the second problem by saying that predators are not necessary to keep animal populations in check. Animals keep their own populations under control by territoriality and instinct. This is sometimes true, of course, but some notable exceptions stand out—for instance, the explosion of deer populations on the Kaibab Plateau in Arizona, resulting, apparently, from overhunting by humans of predatory pumas, and of moose populations on Isle Royale in Lake Superior before the introduction of wolves. Even if all animal populations could be kept in check without predation, they could not be kept in check without death. They continue reproducing, the way God commanded them to in Genesis 1, and overshoot their food supply. Only death can prevent or solve overpopulation. Jansma brought this point to the attention of the creationist readership (1974). He added that *humans* could not reproduce without causing death, since during human procreation billions of sperm die. White responded that God commanded the animals to fill the Earth—not overfill it (1975); therefore, when the Earth was filled with animals, reproduction ceased. But this is not what the Bible says. Genesis 1 gives no hint that "be fruitful and multiply" had any anti-overpopulation mechanism built into it. How were the animals to know that the moment had come for them to stop reproducing?

In addition to not having death, a world created "very good" could not, claim these creationists, have had any decay or disease. Thus, all disease-causing pathogens had some alternative innocuous life-style before the Fall. Viruses—which can only live inside of living cells and can reproduce only by tricking host cells into replicating—could not have existed as we know them today. Because there was no decay, vultures could not have existed; their bald heads and gastrointestinal tracts are specially designed to facilitate the eating and digesting of rotting flesh.

An incalculably large number of biological modifications would have been necessary to transform a pre-Fall world—without predators, disease, or decay—into our present fallen world; in other words, a whole new biology was needed. To accommodate their interpretation of just a few verses of scripture—verses that were themselves capable of other literal interpretations—many creationists have fabricated a whole new dogma of biology.

Everrett Peterson is one creationist who believes that God intended carnivores to eat meat, even before the Fall; he claims they acted as "housekeepers" helping Adam keep the populations of prey in check (1982). As far as I am aware, his article

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is unique in the scientific creationist literature.

Evil design. Who created this whole new biology at the moment of Adam's fall—God or Satan? Most creationists believe the former, but A. E. Wilder Smith hints in his book, *Why Does God Allow It?* that the latter is true (1980). He described an imaginary atheist saying:

> Take, for example, the process of malaria transmission. It shows signs of what looks like careful, well-devised planning, with the single purpose of plaguing and torturing the victim. To me, the whole system looks like a remarkable plan, as if both the good and the bad were planned for mankind and biology.

Wilder Smith is aware of, and sympathetic with, the trouble caused by such appearances of not just evil but evil *design* of such an extent that it seems to him to be beyond the power of evolution to accomplish. Just as the builders of the Cologne Cathedral cannot be blamed for the rubble of its destruction by bombing in World War II, so the designer of all life (God, according to Wilder Smith in his other books, 1970, 1981) cannot be blamed for this evil design. Someone else came in and messed things up. Although he does not make it explicit, he clearly implies that this someone was Satan. But the Bible nowhere indicates that Satan is powerful enough to have redesigned the world of nature.

Wilder Smith was aware of this paradox of evil design, but other scientific creationists seem to not even notice it. Willis Keithley, for instance, wrote an article about a certain carnivorous plant, the serpent's snare:

> The translucent top of the head entices those hapless insects into its crown with a false corona of light. As they buzz futilely around that unholy halo, they eventually fall exhausted into the main stem, where barbaric bristles . . . thrust them relentlessly down the stalk. [1980]

One can almost hear the flower hissing, he says. His conclusion was that this plant could not have evolved. This "sinister" plant had to be designed by a loving intelligence! He never notices that he contradicts himself.

Entropy. But many creationists won't even stop there! Another doctrine, almost universal among the scientific creationists, is that the second law of thermodynamics came into existence at the time of the Fall. The universe is currently "running down," becoming more disorderly. But since God is not the author of confusion (1 Corinthians 14:33), then disorder, or entropy, could not have existed in a sinless Eden.

It has been known since the time of E. Willard Gibbs early this century that the change in energy status of molecules as they undergo a chemical reaction can

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be calculated as the change in heat minus the product of the temperature and the change in entropy. If, indeed, this law of entropy was not in effect before the Fall, then every chemical reaction in the world was different at that time. God would have had to practically re-create the entire Earth and all its living and nonliving components in order to institute the second law of thermodynamics.

Yet, when Robert E. Kofahl attempted to convince the scientific creationist readership that the second law of thermodynamics would have to have been a component of the orderly and good world as God originally created it (1973), he was rebuked by Henry M. Morris (1973). Kofahl said, "Such speculations, if correct, would surely require a totally redesigned and re-created physical universe . . . of such there is no suggestion in the Scriptural record . . ." (1973). If there had been no entropy in Eden, it would have been "irrational, crazy, a nightmare to live in. . . ." Morris's reply is that 2 Peter 3:4–5 refers to and condemns uniformitarian scientists and charges that Kofahl is one of these uniformitarians, stating that Kofahl is opening a "can of worms," trying to "yield to pressures from uniformitarianists," and making a "concession" to them which is "dangerous theologically" (1973). Morris's view remains in the ascendancy among scientific creationists—after all, he is director of the Institute for Creation Research. "No entropy before the Fall" seems to be a creationist doctrine, since any objection raised to it is treated as at least mild heresy.

Events Surrounding the Flood

Re-creating the whole universe in response to Adam's sin is not the only gigantic re-creation invented by some creationists. The Flood and its aftermath provide other imaginative opportunities.

A vapor canopy. The Flood itself has been expanded in scope by creationists to require numerous extrabiblical miracles. This becomes abundantly clear when reading *The Genesis Flood* by Whitcomb and Morris as well as Whitcomb's *The World That Perished*. In the *Creation Research Society Quarterly*, D. Russell Humphreys claimed that the Bible taught, or at least suggested, that Earth's pre-Flood core consisted of water (1978). His biblical evidence was that the Bible made occasional reference to water coming from underground: the springs feeding the rivers of Eden, the mists that rose from the earth in Genesis 2, the opening of the "fountains of the deep" in the Flood. Joseph C. Dillow criticized Whitcomb in a letter to the *Quarterly*, saying that the biblical writer could not have had this theory in mind when he wrote these passages (1979a). This same Joseph C. Dillow, however, was not bothered by extrabiblical speculation when he wrote a series of articles for the *Quarterly*, which since have been organized into book form, about "Earth's pre-Flood vapor canopy" (1982). He presents many calculations concerning how

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a vapor canopy could have remained suspended above the atmosphere without falling to Earth and how it would have produced a uniformly tropical Earth and later provided the Flood rains. He admits that the Bible does not unmistakably teach that there was such a vapor canopy; the most he could say is that "scripture does not rule out a vapor canopy" (1979b).

Glenn Morton calculates that Dillow's model would produce an Earth with surface temperatures far in excess of what life could tolerate (1979). He encouraged "new thinking about the cause of the Flood and the antediluvian climate." In his article, "The Warm Earth Fallacy," he indicated that belief in a canopy and universally warm planet was not a necessary biblical teaching (1980). But this same Glenn Morton invented perhaps the most imaginative extrabiblical emendation of all.

Post-Flood catastrophism. Most creationists believe that virtually all of the fossil-bearing rocks were deposited during the Flood and that the apparent evolutionary order of the fossils resulted from ecological zonation, organism mobility, and hydrodynamic sorting. "Ecological zonation" means that the "oldest" deposits were the ocean habitats, and, since they were already at the bottom, they were buried first by the Flood. The lowland terrestrial habitats were buried next, and so forth. "Organism mobility" means that the "most advanced" animals were able to outrun the flood waters and so were buried last. "Hydrodynamic sorting" occurs when smaller, denser objects settle to the bottom first in turbulent water. Whitcomb and Morris wrote *The Genesis Flood* (1961), which is still the standard creationist book on the subject, and therein describe these extrabiblical explanations. Glenn Morton, however, rejected the entire idea that fossil-bearing rocks were deposited during the Flood (1982). Indeed, he claimed that practically *all* the fossiliferous deposits were produced *after* the Flood during several hundred years of local catastrophes (floods, earthquakes, and so forth). While his theory is an improvement on the usual Flood geology, it provides a breathtaking amount of extrabiblical emendation: the Bible provides genealogies and an outline of historical events from Noah to Abraham and totally neglects to mention that Earth was still writhing and seething with local catastrophes on a scale many hundreds of times greater than today. Morton has filled in this major component of Earth history that the Bible writers forgot to mention.

Glenn Morton is not the only creationist to have put forward an imaginative reinterpretation of the fossil record. Steven Austin studied some Cenozoic deposits in Oregon up to seventy-five-hundred feet thick and concludes that they could not have been deposited underwater (a.k.a. Stuart Nevins, 1974). He argues that they were terrestrial volcanic deposits, although he accepts the Paleozoic and Mesozoic strata underneath them as Flood deposits. Constrained by the young-Earth creationist time-frame that insists on a Flood about four thousand years ago, however, the question arose as to how he could preserve belief in a young Earth, a global Flood, and yet explain seventy-five-hundred feet of terrestrial deposition. There was only

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one solution: invent a new catastrophe.

Austin does not explain how most modern species of plants and animals managed to avoid getting buried in the Paleozoic and Mesozoic deposits, even though they had been in existence since creation week. But he argues that, after the Flood, Earth was repopulated by animals, plants, and humans for seven hundred years. During this time, the weather was very warm (he concludes this from the presence of tropical plants in the Cenozoic deposits). How did the weather become so warm? He postulates the formation of a *new* vapor canopy, similar to the old one which had covered Earth before the Flood. It was this new canopy that caused Earth to become tropical once again. Seven hundred years after the Flood, the new catastrophe began with exploding volcanoes and a collapsing canopy. This time, however, the catastrophe produced not a flood but the Ice Age. So Austin fabricates a whole saga of a postdiluvian warm Earth, canopy, and catastrophe in order to bring his field data into conformity with young-Earth creationist doctrine.

It is not quite fair to say that there is *no* scriptural basis for this scenario. There is a verse that lends itself to this kind of wild imagination—one we have seen before. It is good old Genesis 10:25, which says that Earth "was divided" in the days of Peleg. The Genesis writer did not specify what *divided* meant, so these creationists feel justified in assigning any meaning to it they can possibly use.

An article by Robert Morton in the same *Creation Research Society Quarterly* said that, if Earth had been at its present radius at the time of the Flood, it could not have (without a violation of the second law of thermodynamics) distributed enough sediments to have produced the entire fossil record (1980). This would seem to be a decisive blow against the typical creationist insistence that all sedimentary rocks were produced by the Flood. But Morton comes up with another alternative: the radius of Earth was *smaller* at the time of the Flood. Since he does not specify *how* Earth expanded or with what the newly created volume was filled, I presume he is positing a miracle not hinted at anywhere in scripture. Glenn Morton wrote an article with a similar viewpoint (1983).

Post-flood creation. While many creationists posit post-Flood catastrophes, others believe in post-Flood creation. They find it impossible to explain how all the genetic variation in animal populations could have been represented by a single pair of each kind on the ark, and they cannot explain why many kinds of plants and animals show very localized centers of distribution instead of being descended from Flood survivors that dispersed from Ararat. So what do they do? Again, it is no problem at all to invent another gigantic miracle: God created much or most of today's biota *after* the Flood. Armstrong invoked this explanation for the origin of desert animals (1973) and Lammerts and Howe in reference to plants (1974). Morris insists that, since Genesis 2:1 says that God *completed* his creative work on day six of creation week, post-Flood creation is a willful ignoring of the Genesis record and that anyone who believes it is condemned in 2 Peter 3:4–5, one of Morris's most frequently

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used verses (Morris, 1974). Lammerts defends himself by saying that Psalm 104:30 makes reference to post-Flood creation (1975). Morris likes to believe that there was no entropy before the Fall, even though the Bible does not teach this, but he criticizes Lammerts on the grounds that the Bible does not teach post-Flood creation. Thus, many leading creationists take their imaginary emendations to scripture very seriously, elevating them to doctrinal status.

The Tower of Babel. From the story in Genesis 11:1–9 of the Tower of Babel, many creationists conclude that, after the Flood, God miraculously intervened in history and supernaturally created all of the world's languages in one fell swoop. Thus, the origin of linguistic diversity was instantaneous rather than evolutionary.

However, James E. Strickling warned readers of the *Quarterly* not to read too much into the Tower of Babel account (1980). He argued that the only thing needed was for the faculty of speech to be interrupted (the "confusion of tongues," the loss of the ability to communicate) and the people would disperse. From this, linguistic diversification would follow. The supernatural creation of languages, complete with vocabulary and grammar, is not an essential teaching of Genesis 11.

Peleg's division. This same author, however, did not use such caution when he wrote an article in the same journal two years earlier concerning "Peleg's Division" (Strickling, 1978). Here he focused on Genesis 10:25, which says in part: ". . . the name of one was Peleg; for in his days was the earth divided. . . ." This might mean a political division, but Strickling opted for a geographical meaning. He claimed that this passage refers to the catastrophic cracking open of East Africa's Rift Valley and formation of the Red Sea after the Flood. Patrick Hansen was even more imaginative in his interpretation of this passage, claiming that it referred to the splitting up of the New and Old Worlds, leaving the Mid-Atlantic Ridge as a scar (1983).

Conclusion

So we see from these examples that the scientific creationists have a proclivity to blithely flesh out the skeleton of biblical history with their own fruitful imaginations and even add extra vertebrae to the skeleton and, in some cases, whole new body parts. There is a recurring pattern of one creationist criticizing another's imaginative new theories, only to do a great amount of such theorizing in return. Some theories, like those surrounding Peleg's division, are totally useless, while others, like the vapor canopy and post-Flood catastrophism, are necessary to creationists in their attempts to force geological history into a "biblical" mold.

Scientific creationists are not the only people within Christian tradition to possess extrabiblical emendations. The Catholic church, of course, has a large body

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of tradition and liturgies that function parallel to scripture. The Mormons have whole books full of emendations. And each denomination of Protestantism and fundamentalism has its own traditions which can and often do function parallel to scripture. The Bible is the core around which their doctrines are elaborated, but the genuineness of the core does not automatically make all their emendations acceptable to the rest of us. The emendations must stand on their own.

Many old-Earth creationists and theistic evolutionists have, of course, also gone outside the Bible to obtain information about the history of Earth. Some of their theories—for instance, the "gap" or "ruin-reconstruction" theory (*see,* Blocher, 1984)—are largely imaginary. Why, then, do I bring criticism upon the young-Earth creationists for a practice that appears common among Christians?

The reason is that, since young-Earth creationists claim themselves to be the sole defenders of biblical truth and to base their beliefs upon direct and straightforward biblical teaching, they have implied that their opinions have biblical sanction and that these opinions deserve respect from all people who revere the Bible as inspired scripture. The impression is created that these gigantic sagas are not only true science but straight two-hundred-proof Christianity. In this way, despite their zeal to defend the Bible, these creationists are bringing harm upon it.

I reach two conclusions, one for the benefit of the creationists and one for the benefit of their critics.

First, the creationists should be more careful about the way they use the Bible and be more careful about the quality of articles—whether scientific or theological—that they allow to represent them in their *Creation Research Society Quarterly.* Indeed, the most recent issues of the *Quarterly,* and the publications of the younger creationists in the Students for Origins Research, have had far fewer reprehensible articles in them than did the issues of the *Quarterly* I reviewed for this article. Problems remain. The creationists have still not faced up to the extrabiblical status of the vapor canopy theory and the no-entropy-before-the-Fall theory, which they still defend in print.

Second, I encourage the critics of creationism to not let their opinion of the Bible be lowered by the flights of fancy published by these creationists.

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Demographic Change and Antievolution Sentiment: Tennessee as a Case Study, 1925–1975

George E. Webb

As the creation-science movement attracted greater attention during the early 1970s, many observers expressed surprise at this most recent outbreak of antievolution sentiment. Following as it did the removal of the three remaining antievolution laws passed in the 1920s, creation-science appeared to be an aberration in the intellectual life of the United States. This movement also appeared to be in conflict with the increasingly urban nature of the country, frequently cited as a major reason for the repeal of the earlier antievolution laws during the late 1960s (Nelkin, 1982, p. 34; Larson, 1985, pp. 104–107; Grabiner and Miller, 1974, p. 836). A closer analysis of legislative actions during this period, however, suggests that demographic change represents only a partial explanation of the fortunes of antievolution activity during the late 1960s and early 1970s.

The state of Tennessee represents a particularly good case study of the legislative fortunes of evolution and the significance of demographic change to these fortunes. Tennessee is the only state in which the legislature was responsible for both passage and repeal of antievolution laws. In 1925, as is well known, Tennessee passed the most famous of all antievolution statutes, the Butler Act, which led to the *Scopes* trial that summer. After significant debate, both the Senate and House passed this bill with overwhelming votes of twenty-four to six and seventy-one to five, respectively (Bailey, 1950, pp. 482–488). Forty-two years later, the legislature repealed this law, in direct contrast to the laws in Arkansas and Mississippi, which were invalidated by court action. Similarly, Tennessee passed the first creation-science law in 1973, which required "equal time" for the Genesis account of creation in biology classes and textbooks. Although this act was struck down in federal courts

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two years later, Tennessee's action gave an important boost to proponents of such legislation in other states (Larson, 1985, pp. 93–139).

The rural-to-urban shift which has characterized much of American life in the twentieth century also has been clearly visible in Tennessee, as has its impact on the political life of the state. The state was clearly rural in the 1920s, with nearly 74 percent of the population in communities of less than twenty-five hundred. This situation may explain the attraction of Representative George Washington Butler as a focal point in the evolution debate of the 1920s. Butler represented a constituency in the rural north central section of the state which had a white illiteracy rate of 22 percent in 1920, more than twice the state average and nearly ten times the national average. A member of the Primitive Baptist Church, Butler had no more than four years of formal education (Bailey, 1950, p. 476; *Fourteenth Census*, 1920; *Fifteenth Census*, 1930).

The census of 1960 indicated a change in the complexion of Tennessee's population. For the first time, more than half the state's residents lived in census-defined urban areas. Since 1920, the rural population had remained largely unchanged while the urban population had more than tripled. At least in part because of the rural-to-urban shift, Tennesseans had become better educated by the 1960s. Among those persons twenty-five years of age or older, the median number of years spent in school was 8.8. Although nearly two years fewer than the nation's median, this was a significant improvement over the situation in 1920 (*Eighteenth Census*, 1960, part 1, p. 207; part 44, pp. 146–147). At the same time that these changes were publicized, Tennessee's legislative apportionment, which had remained unchanged since 1901, was being challenged in federal court. This situation led to the landmark Supreme Court decision in *Baker* v. *Carr*, which ultimately led to more equitably divided districts. The legislature which repealed the Butler Act in 1967 was chosen under this new apportionment scheme, which increased urban representation at the expense of rural representation (Friborg, 1965, pp. 189–207; Murphy, 1972, pp. 384–391).

The decades following the passage of the Butler Act in 1925 witnessed several attempts to repeal Tennessee's antievolution law, none of which met with any success. Therefore, when the House of Representatives began considering yet another repeal attempt in early 1967, few observers were optimistic about its fate. Although the House passed the bill to repeal by a substantial vote of sixty to twenty-nine, it still had to go through the Senate, where more forceful opposition was expected (*House Journal*, 1967, pp. 553–554). While the Senate was considering the House bill, as well as a bill of its own to amend the Butler Act to allow the teaching of evolution as a theory rather than as a fact, a new variable was added to the debate when a science teacher in rural east Tennessee was dismissed for teaching evolution to high school students. This teacher, Gary Scott, with assistance from the American Civil Liberties Union and the National Education Association, soon brought suit challenging the constitutionality of the Butler Act. Scheduled for the

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Table 1.

VOTE TO REPEAL BUTLER ACT (1967)
(+ = Yes; − = No)

Political Party

Vote	Dem.	Rep.
+	43	17
−	8	21

$X^2 = 15.53$ $\phi = 0.417$

Profession

Vote	Professional	Nonprofessional
+	33	26
−	7	22

$X^2 = 7.92$ $\phi = 0.300$

Church Affiliation

Vote	High	Middle	Low
+	11	26	15
−	2	8	16

$X^2 = 8.02$ C = 0.305

Population Density (Persons / Square Mile)

Vote	Most Urban 750+	Semi-urban 250–749	Semi-rural 60–249	Rural 0–59
+	23	9	11	17
−	3	9	7	10

$X^2 = 8.297$ C = 0.292

federal district court in Nashville, this suit would feature the famous attorney William Kunstler as Scott's counsel (*New York Times*, April 15, 1967; *Nashville Tennessean*, April 15, 16, May 16, 1967; *Knoxville News-Sentinel*, April 15, 16, May 4, 5, 12, 13, 1967). Faced with the possibility of another evolution case in a Tennessee court, many senators ignored the continued opposition and eventually repealed the Butler. Act in mid-May by a vote of twenty to thirteen (*Senate Journal*, 1967, pp. 862, 896).

An analysis of the repeal vote in the House of Representatives, chosen because of its greater number of members, provides interesting data concerning the impact of various variables on voting behavior (Table 1, *Tennessee Blue Book*, 1967). Using chi-square methods to isolate variables for later analysis, no relationship stronger than 0.417 appears in the data. Party affiliation proves to be the strongest predictor of legislators' voting, with Republicans (except those from the most urban areas) more likely to oppose repeal and Democrats more likely to support repeal. This is a curious finding, because at no time was the Butler Act repeal a party issue and because there is no relationship between the rural or urban nature of a representative's district and party affiliation. Analyses of the rural or urban nature of districts,

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Act in 1967 and called the 1973 legislation "a remedy to a bad act" (*House Journal*, 1973, pp. 533, 844, 898, 1152; *Nashville Tennessean*, April 27, 1973). With the Senate's approval of the four amendments on April 30, the legislature sent the bill to Governor Winfield Dunn's office, where it became law at midnight, May 8, without the governor's signature (*Senate Journal*, 1973, pp. 1046–1049, 1301, 1527).

Because of the lopsided vote on the passage of the bill, an analysis of the legislature in terms of voting patterns must be viewed carefully. There are, nonetheless, interesting data to be found in such an analysis. Many variables, such as education and party, show no significant relation to voting behavior (Table 2, *Tennessee Blue Book*, 1973). Indeed, only professional status, religion, and constituency show any dependence patterns with voting behavior. Professional status shows a low measure of correlation, while rural-urban status and religion display a slightly higher correlation. Despite the uncertain nature of this data, it seems likely that demographic change played no stronger role in 1973 than it had in 1967.

A comparison of those legislators who voted on both bills reveals strong consistency, although only eleven members of the House are included in this group. Eight of the eleven voted in a consistent manner, voting to repeal the Butler Act and against the "Genesis Act" or vice versa. The three who voted inconsistently voted in favor of both bills.

A cursory examination such as this cannot possibly investigate all the possible influences on legislators' voting decisions or the relative strength of the variables isolated. From this study, it nonetheless appears clear that the legislative fortunes of evolution in Tennessee may not be explained solely in terms of the rural-to-urban shift which characterized the state's demography in the decades following *Scopes*. The increasingly urban nature of the state appears to have had only minimal impact upon attitudes toward evolution. Rather, the repeal of the Butler Act in 1967 is better explained as an aberration in this antievolution sentiment brought about by a number of unusual circumstances. These circumstances included the prospect of another Scopes trial and Tennessee's attempt to build a more favorable image in the hope of attracting new business and industry to improve the state's poor economy. Similarly, the 1973 "Genesis Act" can be explained as a partial return to the old order, with legislators seeing in creation-science a way to record their opposition to teaching evolution in the public schools. Such legislative action appears to support the hypothesis that opposition to evolution displays a great deal of continuity and that this opposition cannot be dismissed as a historical artifact of an earlier rural society.

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Book Review

Science and Earth History: The Evolution/Creation Controversy by Arthur N. Strahler (Buffalo, NY: Prometheus Books, 1987), 552 pages, indexed, cloth $39.95 (discount to NCSE members).

The paired shibboleths *creation* and *evolution* hide complex issues involving so many disciplines that a comprehensive study provided an exceptional challenge. Arthur N. Strahler, a retired professor and former chairperson of the geology department at Columbia University and a textbook author for thirty-seven years, accepted the immense task in 1981. Having thoroughly examined every aspect and available source of the contentious topics, he checked with numerous colleagues and updated this remarkably readable account to include events as recent as the U.S. Supreme Court's June 19, 1987, decision on the Louisiana creationist legislation. He retained a sense of humor, maintained proper context for his quotations, avoided ad hominem arguments, and criticized each side for the distortions and arrogance which have arisen. Thus, a gentleness rarely encountered amid the bitterly opposed factions characterizes his encyclopedic study. Arthur Strahler is neither a creationist nor a humanist; he is a distinguished scientists who expresses "what natural science

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is about and how scientists are doing it" through patient explanation of the conflict.

Lois Darling's fine cover drawing of Charles Darwin's venerable and benign visage is featured under Michelangelo's Sistine Chapel representation of God (almost identical!) in delicious irony. Another three hundred illustrations enhance this volume, in which large pages accommodate about one thousand words per page in two compact columns. Abbreviated and expanded tables of contents and an exhaustive bibliography and index allow quick access to any topic or source. The price is very reasonable for such thorough documentation.

Fifty-four chapters comprise nine parts and a brief "Summation and Verdict—Creation Science Assessed." Philosophy and scope of science, contrasted to pseudoscientific scenarios, are introduced in part one. Research fields and belief fields have been distinguished according to Mario Bunge's criteria ("What Is Pseudoscience?" *The Skeptical Inquirer* 9:1:36–46). Theology only enters the fray when the fields are mixed in pseudoscience; theists who accept mainstream science have been quoted, including Jesuit scholar James Skehan and the Church of England's Archbishop John Habgood of York, without severe criticism. Part two, "Creationism—Its Roots and Tenets," refers to the "creation science" movement within fundamentalism rather than to the whole gamut of theistic interpretations which do not necessarily confuse the fields. According to this usage, with which I concur, most biblical believers are not creationists.

Parts three through six contrast two views of cosmology and astronomy, geology and crustal history, origins of landscapes, and stratigraphy and the fossil record. The predominant interpretations are independent of Darwinian bias, though all of these sciences are labeled "evolution" by creationist literature and insinuated to be evil. Evolutionary theories as such come into play in the final three sections—"Integrity of the Evolutionary Record Under Attack by Creationists," "The Rise of Man and Emergence of the Human Mind," and "The Origin of Life on Earth—Naturalistic or Creationistic?"

Early history of geological theories may deserve more coverage—not only to show how long ago some creationist explanations began but to demonstrate that diluvialism included moderate positions and greater adaptability to fresh evidence than modern creationism allows. Nonetheless, errors and omissions are few and minor.

Anyone seeking understanding of the issues treated by this book ought to acquire a copy.

—reviewed by John R. Armstrong, geologist and deacon, Calgary, Alberta, Canada

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Letters to the Editor

I greatly enjoyed Robert W. Loftin's fine article, "Caves and Evolution" (*Creation/Evolution* XXIII). However, I about fell out of my chair when I read the sentence, "The evolution account presents genuine problems" (p. 27). Of course, he explains later that the problems are true puzzles of nature—not the kind of problems that comes with trying to explain away facts that don't conform to the creation model. But I can easily imagine that sentence showing up in future creationist literature, stripped of its surroundings, as proof positive that evolutionists such as Loftin have their doubts about the theory of evolution.

I know it's difficult for writers and editors to be on constant guard against the possibility of being quoted out of context. Still, what amazes me is that the creationists can read all that excellent literature on evolution, searching for their out-of-context quotes, and yet have none of it sink in.

Thomas Richards

I wish to comment on G. Richard Bonzarth's critique of my definition of religion, which he characterized as "as ridiculous as it is wrong" (*Creation/Evolution* XXIII, pp. 44–46).

I think it unfortunate that Bonzarth prefers a definition so narrow as to include only the type of belief systems of which he is apparently an avid supporter. Many atheists, of course, would agree with his definition, since they wish to include only those systems with which they disagree; such disbelief in the symbols of others is the cornerstone of their own religious fervor. I chose a broad definition since it was useful in developing the points I was trying to make. I did not invent this definition; it's a synthesis of a broad discussion in the anthropological and sociological literature ongoing for many years. Bonzarth's insistence that an ideology devoid of supernatural symbolism does not merit the label of "religion" excludes many ideological systems which are widely regarded as religious. These systems have all the sociological and psychological characteristics of religions but have radically different sacred symbols. Most Americans, apparently including Bonzarth, have very limited experience with religions other than the theistic religions of the Judeo-Christian tradition.

Bonzarth complains that my definition would include all views on morality and ethics. He fails to understand that in most cultures religion is indeed considered as encompassing all aspects of social life Clothing styles, family size, planting dates, speech patterns,

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marriage practices, food preferences, and a thousand other aspects of life are governed by religious beliefs. Toleration of a minority religion is relatively rare in human history, since it is considered disruptive of the social fabric of the society.

The separation of "secular" ethics from "religion" is a relatively recent one—a product of the truce arranged between warring factions of Christians since the Reformation. All Christians, as well as Jews and humanists, share a great portion of their ethical beliefs in common, although they differ greatly in detail and application. The common ground spanning sectarian denominations has been separated out as "secular" and forms the framework holding our society together. Thus, we have developed a two-tiered system. Many other belief systems, I must point out, will strongly disagree with many of the "ethical" values we Americans take for granted. Our society could not survive long with a sizeable minority practicing, say, the religion of the ancient Aztecs.

Joseph E. Laferriere

Just a quick observation on Paul Ellwanger's "Uniform Origins Policy" (*Creation/Evolution* XXIII): As I read it, there would be no way to prevent any teacher from teaching creationism because section four of the policy prevents firing such a teacher if he or she is "acting in good faith" and comparing that to "teaching any other subject matter in good faith."

Lee Fairbanks

SELF-CORRECTION CORNER

Two errors appeared in Robert W. Loftin's article, "Caves and Evolution," in *Creation/Evolution* XXIII, and the author wishes to make the following corrections:

1. On page twenty-two, paragraph four, an incorrect formula was given for calcium bicarbonate. The correct formula is: $Ca(HCO_3)_2$

2. While gypsum is a salt, it was incorrect to say that it is a salt *of* calcium sulfate, since gypsum *is* calcium sulfate. This error appeared on page twenty-three, paragraph four.

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OBITUARY

LUIS ALVAREZ

Luis Alvarez, age seventy-seven, died on August 31, 1988, after losing a battle with cancer. Alvarez had been with the Lawrence Berkeley Laboratory for thirty-five years and was responsible for the discovery of a number of subatomic particles—work for which he received the 1968 Nobel Prize for physics.

In recent years, however, he has been most noted for his research in theoretical paleontology. With his son, Walter, he propounded and popularized the idea that dinosaurs and much of the world's flora and fauna became extinct sixty-five million years ago as a result of the impact of a large asteroid or comet which created a devastating worldwide dust cloud which lowered temperatures. This hypothesis, in turn, became a major factor in the development of contemporary ideas about "nuclear winter" as a predictable result of nuclear war. The Alvarezes argued that Iridium deposits found at diverse locations around the globe dating to the end of the Cretaceous could best be explained by a single worldwide atmospheric pollution deposit of particles from outer space. The specific idea has been severely challenged, but it has set in motion an entire genre of neocatastrophist theories, from Oort Cloud to Nemesis to prehistoric acid rain as causes for dinosaur extinction. The primary critique is that species did not all go out of business within a couple of years, as the hypothesis would suggest, but rather the extinction took a very long time, even if it was accelerated. Still, the majority of paleontologists now give credence to some degree of catastrophic extinction event a la Alavarez. Bitingly critical of paleontologists who rejected his ideas, he recently commented, "I don't like to say bad things about paleontologists, but they are not very good scientists. They're more like stamp collectors."

Earlier in his career, Alvarez developed three major radar systems, including the Ground Control Approach method of landing planes in zero visibility. In recent years, he developed the radar-mapping system used by archaeologists to probe underground features—a technique used to prove that the Pyramid of Cheops has no "secret chambers," for example.

During World War II, he was a physicist at the Los Alamos atomic bomb project. When the bomb was actually dropped on Nagasaki in 1945, he was the only one of the scientists who flew on the mission as an observer of what they had wrought. At congressional hearings in 1953 investigating the loyalty of J. Robert Oppenheimer, director of the Los Alamos Project, Alvarez and Edward Teller agreed to testify, contrary to the advice of their superior, Ernest Rutherford. Alvarez supported Teller's advocacy of H-bomb development opposed by Oppenheimer and many others, but he said that Oppenheimer's opposition was no reflection upon his patriotism. Oppenheimer nevertheless lost his security clearance, and many scientists never forgave Alvarez for participating in the process which felled their hero.

As the inventor of hydrogen bubble chambers, now familiar to generations of students, Alvarez invented the primary way for identifying subatomic particles: their distinctive paths can be photographed and literally seen with the naked eye.

Alvarez is survived by his wife and four children.

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